COLLEGE OF THE ROCKIES

Mathematics Intermediate Level (Algebraic) - MATH 070
Upgrading for Academic and Career Entry

Course Outline

COURSE IMPLEMENTATION DATE:	**September 2015**
OUTLINE EFFECTIVE DATE:	**September 2022**
COURSE OUTLINE REVIEW DATE:	**April 2025**

GENERAL COURSE DESCRIPTION:

MATH 070 is an entry level course that prepares students for higher level Algebraic Math courses. Topics range from essential computation and problem-solving skills to algebra and trigonometry, with a much higher emphasis on algebra than MATH 072. It is mainly intended for those students wishing to prepare for MATH 080 – Advanced Level Algebraic Math.

Program Information: Math 070 can be used as a prerequisite for MATH 080 and MATH 082.

Delivery: This course is delivered in a directed studies format.

Hours for this course: 90 hours

Typical Structure of Instructional Hours:

Instructional Activity	Duration
Lecture Hours	
Seminars / Tutorials	
Laboratory / Studio Hours	
Practicum / Field Experience Hours	
Other Contact Hours	90
Total	90

Practicum Hours (if applicable):

Type of Practicum	Duration
On-the-job Experience	N/A
Formal Work Experience	N/A
Other	N/A
Total	N./A

Other Contact Hours:
- Directed Studies

Course Outline Author or Contact:

Allison Platt, BSc, BEd

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Signature

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APPROVAL SIGNATURES:

Department Head
Joy Brown
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Dr. Jack Moes
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Department Head Signature

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Dean Signature

EDCO

Valid from: September 2022 – April 2027

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Education Council Approval Date

COURSE PREREQUISITES AND TRANSFER CREDIT:

Prerequisites: Either MATH 060, Mathematics 9 or equivalent, or permission of the instructor.

Corequisites: None

Flexible Assessment (FA):

Credit can be awarded for this course through FA ☑ Yes ☐ No

Learners may request formal recognition for flexible assessment at the College of the Rockies through one or more of the following processes: External Evaluation, Worksite Assessment, Demonstration, Standardized Test, Self-assessment, Interview, Products/Portfolio, Challenge Exam. Contact an Education Advisor for more information.

Transfer Credit: For transfer information within British Columbia, Alberta and other institutions, please visit http://www.cotr.bc.ca/Transfer.

Students should also contact an academic advisor at the institution where they want transfer credit.

Prior Course Number: N/A

Textbooks and Required Resources:

Textbook selection varies by instructor and may change from year to year. At the Course Outline Effective Date the following textbooks were in use:

> Brodie, S., Corbett, P, Grinder, P., Robbins, P., Sarsiat, A. (1999). *Adult Basic Education Intermediate Level Mathematics,* A Series of 14 Modules. Province of British Columbia, Ministry of Advanced Education, Training and Technology and the Centre for Curriculum, Transfer and Technology

> Martin-Gay, K.E. *Introductory Algebra,* 2nd Edition. 2003 Prentice Hall, Inc.
> ISBN: 0-13-067684-5

Please see the instructor's syllabus or check COTR's online text calculator
http://go.cotr.bc.ca/tuition/tCalc.asp for a complete list of the currently required textbooks.

LEARNING OUTCOMES:

Estimation is a skill that is emphasized. Students are strongly encouraged to check answers and that solutions are reasonable in the context.

1.   Operations with Rational Numbers

It is expected that students will be able to:
- write fractions as decimals and decimals as fractions
- add, subtract, multiply, and divide rational numbers
- use order of operations
- graph rational numbers on the number line
- define absolute value

2.   Measurement

It is expected that students will be able to:
- use the common metric units for temperature, length, area, volume/capacity and mass
- use the common Imperial or US Customary units for temperature, length, area, volume/capacity and force
- convert between and within metric and Imperial or US Customary units using tables and/or calculators
- use proportional reasoning for conversions

3.   Perimeter, Area, and Volume

It is expected that students will be able to:
- find perimeters of triangles, squares, rectangles, parallelograms, trapezoids, circles and composite figures using formulas
- find areas of the above shapes using formulas
- find the surface areas of cubes, rectangular solids, right cylinders, spheres, and composite solids using formulas

- find the volumes of cubes, rectangular solids, right cylinders and cones, spheres, and composite solids using formulas
- distinguish between concepts of perimeter and area and their respective units

4. **Ratio, Proportion and Percent**

It is expected that students will be able to:
- read, write, interpret and compare ratios
- read, write and identify proportions and use them to solve problems
- use ratio and proportion to interpret and make scale drawings
- use ratio and proportion to solve problems involving similar triangles
- use ratios and proportions to solve problems involving:
    i) finding percent when part and whole are known
    ii) finding part when percent and whole are known
    iii) finding whole when part and percent are known

5. **Algebra**

It is expected that students will be able to:
- explain the use of variables
- evaluate algebraic expressions using substitution
- combine like terms and remove parentheses
- solve first degree equations in one variable
- translate a problem into an equation
- use equations to solve problems
- solve simple formulas for a given variable
- use formulas to solve problems

6. **Linear Equations and Graphing**

It is expected that students will be able to:
- draw a Cartesian co-ordinate system
- plot and name points in a Cartesian co-ordinate system
- given an equation in two variables:
    i. determine if an ordered pair is a solution
    ii. find ordered pairs which are solutions
- graph equations of the form $x = a$ and $y = b$
- define slope and relate to grade and pitch
- graph linear equations using
    i. slope and y-intercept
    ii. two intercepts
    iii. a table of values
- find x- and y-intercepts;
- determine the equation of a line, $y = mx + b$, given
    i. its graph
    ii. its slope and a point on the line
    iii. two points on the line
- solve problems using graphs of linear equations

7.   Powers, Roots, and Scientific Notation

It is expected that students will be able to:
- read and write numbers expressed as powers
- evaluate powers with integral exponents
- apply laws of exponents to simplify expressions
- express numbers using scientific notation
- convert between scientific and standard notation
- determine the square root of a perfect square
- express a square root as a mixed radical in simplest form (numerical radicands only)
- approximate square roots of real numbers using a calculator

8.   Polynomials

It is expected that students will be able to:
- distinguish between monomials, binomials, trinomials and other polynomials in one variable only
- apply the laws of exponents to variable expressions with integral exponents
- evaluate polynomials by substitution
- add, subtract, and multiply polynomials in one variable
- factor polynomials by removing the largest common factor
- factor binomials of the form $a^2x^2 - b^2y^2$;
- factor trinomials of the form $ax^2 + bx + c$ with a = 1 ONLY
- divide a polynomial by a monomial

9.   Trigonometry

It is expected that students should be able to:
- name parts of a triangle
- find missing side of a right triangle using the Pythagorean Theorem
- find the measure of an unknown side or angle of a right triangle using sine, cosine, or tangent ratios
- solve problems using right angle trigonometry

The outcomes of this course meet and are consistent with the outcomes prescribed for Mathematics: Intermediate Level – Algebraic Mathematics in the Adult Basic Education: A Guide to Upgrading in British Columbia's Public Post-Secondary Institutions – An Articulation Handbook 2021/22 Edition.

EVALUATION AND ASSESSMENT:

Assignments	% Of Total Grade
Module Tests*	50%
Midterm**	20%
Final Exam***	30%
Total	100%

Note:

    *   Tests: students must achieve 70% or better to progress to the next module.

    **   Midterm: students must achieve 65% or better to progress to the next module.

    *** Final Exam: students must achieve 50% or better to pass the course.

Please see the instructor's syllabus for specific classroom policies related to this course such as details of evaluation, penalties for late assignments, and use of electronic aids.

EXAM POLICY:

Students must attend all required scheduled exams that make up a final grade at the appointed time and place.

Individual instructors may accommodate for illness or personal crisis. Additional accommodation will not be made unless a written request is sent to and approved by the appropriate Department Head prior to the scheduled exam.

Any student who misses a scheduled exam without approval will be given a grade of "0" for the exam.

COURSE GRADE:

Course grades are assigned as follows:

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Mark (Percent)	≥ 95	94-90	89-85	84-80	79-75	74-70	69-65	64-60	59-55	54-50	< 50

A grade of "D" grants credit, but may not be sufficient as a prerequisite for sequential courses.

ACADEMIC POLICIES:

See www.cotr.bc.ca/policies for general college policies related to course activities, including grade appeals, cheating and plagiarism.

COURSE CHANGES:

Information contained in course outlines is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational, employment, and marketing needs. The instructor will endeavour to provide notice of changes to students as soon as possible. The instructor reserves the right to add or delete material from courses.